

Energy Storage Solutions Deployed in Singapore For a More Sustainable Future

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The Energy Market Authority (EMA) has partnered industry stakeholders, the research community and other government agencies to co-create Energy Storage System (ESS) solutions which will help support the growth of solar deployment. This includes the deployment of Singapore's first utility-scale ESS at a substation in October 2020, and distributed ESS at electrical switchrooms for five Housing and Development Board (HDB) blocks in Punggol.

2. Solar is the most viable renewable energy source for Singapore. With ESS, the intermittency challenges of solar energy due to cloud cover and rain in our tropical climate can be mitigated. ESS enables the storage of solar energy for later use. The fast response nature of ESS will also help to maintain a reliable source of power supply when solar installations are affected by weather changes. These advantages are key enablers for Singapore to maximise solar as one of the four switches in Singapore's Energy Story.

Singapore's First Utility-Scale Energy Storage System

3. Singapore deployed its first utility-scale ESS at a substation this month, through a partnership between EMA and SP Group, has a capacity of 2.4MW/2.4MWh, which is equivalent to powering more than 200 four-room HDB households for a day. The ESS will participate in the wholesale electricity market to provide services necessary to mitigate intermittency caused by solar, as well as reduce peak demand. The utility-scale energy storage system will also provide insights into ESS' performance under Singapore's hot and humid environment and will aid in establishing technical guidelines for such deployments which are currently not available.

4. EMA Chief Executive, Mr Ngiam Shih Chun, said: "Energy storage systems are one of the most promising solutions to help Singapore integrate more solar energy into the power grid. We have been working with partners to facilitate the deployment of different ESS solutions. This is critical in supporting Singapore's target of at least 2 gigawatt-peak of solar deployment by 2030."

5. Mr Stanley Huang, Group Chief Executive Officer, SP Group, said, "SP Group is committed to supporting our transition to a low-carbon, smart energy Singapore. The deployment of ESS, designed for local conditions, will enable us to incorporate a greater amount of renewables and other sustainable energy solutions into our electricity grid."

Deployment of Energy Storage System at Punggol HDB Estate

6. EMA has also worked with Sunseap and HDB to deploy distributed ESS at electrical switchrooms for five HDB blocks in Punggol. This project seeks to address solar intermittency for large-scale solar installations by using HDB blocks as test sites. Moving forward, insights gained from this project will demonstrate how it can potentially be applied for future deployments in Singapore.

ESS Technology Roadmap, Technical References and Handbook

7. To guide the development of Singapore's ESS ecosystem, EMA commissioned the Energy Research Institute @ NTU (ERI@N) and the Agency for Science, Technology and Research (A*STAR) to develop Singapore's first ESS Technology Roadmap. The roadmap provides insights on the technological trends and economics of ESS, and can be accessed online at go.gov.sg/ess-roadmap-2020.
8. Supplementing the roadmap is Singapore's first set of technical guidelines to educate and guide consumers on the safe and reliable deployment of ESS in Singapore. Formulated by EMA, Enterprise Singapore, the Singapore Standards Council and key players in the public and private sectors, such as the Singapore Civil Defence Force and SP Group, the Technical Reference 77 (TR 77) is available from the Singapore Standards eShop at www.singaporestandardseshop.sg.
9. Ms Choy Sauw Kook, Director-General (Quality & Excellence), Enterprise Singapore, said, "As Singapore shifts towards increased use of renewable energy, we are glad that TR 77 will help guide enterprises to develop safe and reliable energy storage systems for deployment in a tropical urban environment. The clear communication protocols in TR 77 will also help reduce ambiguities during system integration between ESS and system owners, reducing the cost of implementation."
10. EMA has also published a Handbook for ESS which serves as a step-by-step guide on the regulatory requirements to install ESS. The Handbook can be accessed online at go.gov.sg/ema-ess-handbook.
11. Over the years, EMA has launched several grant calls and programmes to build the ESS ecosystem in Singapore amongst the industry and research community. These collaborations have led to grant calls that spurred innovative solutions such as the virtual power plant and smart ports. For more details, visit www.ema.gov.sg/Energy_Storage_Programme.aspx.

Annex A: Factsheet for Singapore's First Utility-Scale ESS

Annex B: Factsheet for Distributed ESS Deployment at Punggol

Annex C: Factsheet for Singapore's Energy Story

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